

**REMARKS**

The Examiner rejected claims 1-2 and 5 under 35 USC 102(b) as being anticipated by DeTorre (US 4,140,820). Claims 3 and 6-8 were rejected under 35 USC 103(a) as being unpatentable over DeTorre in view of Duecker (US 5,927,582). Claim 4 was rejected under 35 USC 103(a) as being unpatentable over DeTorre in view of Chakrabarti et al (US 6,247,625 B1). Claims 9-11, 13-14 and 16-19 were rejected under 35 USC 103(a) as being unpatentable over DeTorre in view of Duecker. Claim 12 was rejected under 35 USC 103(a) as being unpatentable over DeTorre in view of Chakrabarti et al.

**CLAIMS 1-2 and 5 rejected under 35 USC 102(b)**

The Examiner rejected claims 1-2 and 5 under 35 USC 102(b) as being anticipated by DeTorre. The Office action states that DeTorre discloses at least one splitting element (116) positioned on the pre-scored plane (Fig 6.), at least one torque inducing element (112), a stabilizing element (114), and that the splitting element is block shaped (116).

The Applicant respectfully traverses this rejection on several grounds. First off, the Applicant respectfully asserts that the DeTorre patent is non-analogous art and therefore is not proper prior art. It is clearly not in the field of endeavor of electronic circuit production as is the present invention nor is it reasonably pertinent to the problem at hand. The principles of breaking glass along a score are well known and have been utilized for centuries. Glass is itself a rigid crystalline brittle structure. The present invention, however, goes to separating complex electrical circuit structures 12 from a multiple board array 20. Unlike glass, simple application of force to the surface can result in injury to electrical components 16 mounted on the circuit board 12. Additionally, while simple scoring and large scale force may be applicable to glass breaking, such techniques are far too unrefined for application to circuit board separation. Therefore, the Applicant respectfully submits that the DeTorre patent is not properly usable as prior art.

Additionally, the Applicant respectfully traverses the Examiner's assertion that the DeTorre reference discloses or teaches a stabilizing element (114) as asserted by the office action. The Applicant calls the Examiner's attention to column 10 lines 29-34 of the DeTorre reference. The Applicant notes that elements 112, 114, and 116 of the DeTorre reference are all taught as movable anvils used to apply a bending moment about the middle one. While these may be torque inducing, they are clearly not the equivalent of the present invention's stabilizing element 44 utilized to prevent flexing of the circuit board array 20. If subjected to the DeTorre apparatus, large scale board flexing would be guaranteed based upon the physics of the design taught by DeTorre. Therefore, in addition to being non-analogous, the DeTorre reference does not teach every element of the present invention as taught in claims 1-2 and 5.

Finally, it should be noted that the present invention includes a torque element capable of loading the multiple board array 20 without loading the electrical components 16 as not taught by DeTorre. The present invention further includes a torque element utilizing edge loading as is not taught by DeTorre. And DeTorre does not teach the reduction of board flex through the use of surface loading. For these and the aforementioned arguments, the Applicant respectfully requests the rejections to claims 1-2 and 5 be removed.

**Claims 3 and 6-8 rejected under 35 USC 103(a)**

The Examiner rejected claims 3 and 6-8 under 35 USC 103(a) as being unpatentable over DeTorre in view of Duecker. The Office action stated that DeTorre discloses the invention but fails to disclose that the stabilizing element includes a plate member and a plurality of springs, that at least one torque element is a pneumatic lever, or a transport with a plurality of wheels. The office action states that Duecker teaches a plate member (41) and a plurality of springs (44), a transport element (24) with a plurality of wheels (25), and that the torque element is pneumatic. The office action thereby asserts it would have been obvious to combine these two references to arrive at the present invention.

The Applicant respectfully traverses the Examiner's rejections. The Applicant respectfully reasserts all of the above arguments regarding the inappropriateness of the

DeTorre reference as well as its inadequacies in failing to teach every element of the present claimed invention. The Applicant further asserts that Deucker is inappropriate as a prior art reference as well as it is non-analogous. Deucker teaches an apparatus for ripping apart stacks of corrugated cardboard boxes. The subject matter, the scale of operation, the forces involved, the physics involved with ripping cardboard are all well outside the field of endeavor of the present invention and would not be reasonably looked to as pertinent to the present invention's problem. Again, the Deucker reference deals with a material that is non-comparable to the loaded circuit board of the present invention. The stack of cardboard will not be damaged by minor flexing or loading forces applied to the circuitry mounted on its surface (as it inherently has none). Furthermore the ripping functions it utilizes would place it far beyond any considerations of usage.

What the office action attempts to construe as teaching a stabilizing element with a plate and springs is in fact a high pressure clamp whose purpose is to secure the stack of cardboard such that the ends can be ripped off and not to stabilize a circuit board to prevent board flex. Again, neither the DeTorre reference nor the Deucker reference are proper prior art as they are both non-analogous. Furthermore, as the DeTorre reference fails to teach every element of the underlying claims, the combination of DeTorre and Deucker fails to teach every element of the rejected dependent claims. Therefore, the Applicant respectfully requests the rejections to the above claims be removed.

**Claim 4 and 12 rejected under 35 USC 103(a)**

Claims 4 and 12 were rejected under 35 USC 103(a) as being unpatentable over DeTorre in view of Chakrabarti et al. The office action states the DeTorre teaches every claimed element of the present invention with the exception of the splitting element being wedge shaped, that Chakrabarti teaches the use of such a wedge shaped splitting element and that the combination would have been obvious.

The Applicant respectfully traverses the Examiner's rejections. The Applicant incorporates the aforementioned arguments in regards to the DeTorre reference and reasserts them. Furthermore, the Chakarabarti reference teaches the use of cleaving and not torque splitting as claimed by the present invention. As such, Chakarbarti applies

considerable force to the material (having to cleave through it) and thereby would likely be inappropriate for use with a circuit board array loaded with electrical components as claimed by the present invention. Therefore, the Applicant asserts that neither DeTorre nor Chakrabarti et al., either alone or in combination, teach every element of the present claims and therefore are not appropriate as a basis for rejection. The Applicant therefore respectfully requests the rejections to claims 4 and 12 be removed.

**Claims 9-10, 13-15 and 16-19 were rejected under 35 USC 103(a)**

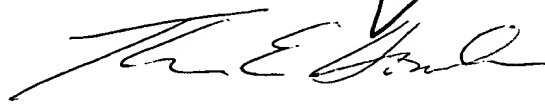
The office action reasserts its arguments in regards to DeTorre in light of Deucker, however applying them to claims 9-10, 13-15 and 16-19. The Applicant traverses these rejections and asserts the identical arguments as those asserted by the applicant to these references being applied to claims 1-3 and 5-8. Furthermore the Applicant respectfully traverses the rejection of claims 16-19 on further grounds. Claims 16-19 are directed towards a method of separating individual circuit boards from a multiple board array. Neither DeTorre or Deucker either alone or in combination teaches anything about processing circuit boards in any fashion. Additionally, these references are clearly non-analogous when applied to such procedures. As previously argued, the nature, scale, physics and methodologies utilized by these references do not contain all the limitations of the present invention and are not within its field of endeavor. Nor, due to the wide discrepancies of applications, are they reasonably pertinent to the problem the present invention addresses. Therefore, the Applicant respectfully requests the rejections to claims 9-10, 13-15 and 16-19 be withdrawn.

**CONCLUSION**

The Applicant would like to thank the Examiner for his assistance. In light of the above amendments and remarks, Applicant submits that all objections and rejections are now overcome. Applicant has added no new material to the application by these amendments. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited.

Should the Examiner have any questions or comments that would place the application in better condition for allowance, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "T. E. Donohue", written over a horizontal line.

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**"VERSION WITH MARKINGS TO SHOW CHANGES MADE"**

Claim 1 has been replaced with the following:

1. An apparatus for separating individual circuit boards from a multiple board array with pre-scored planes and a plurality of electrical components comprising:

at least one splitting element positioned along one of the pre-scored planes; and

at least one torque inducing element using edge loading to mechanically [forcing] force the multiple board array onto said at least one splitting element and thereby breaking the multiple board array along the pre-scored plane said at least one torque inducing element forcing the multiple board array without loading the plurality of electrical components.

Claim 3 has been replaced with the following:

3. An apparatus as described in claim [1] 2 wherein said stabilizing element includes a plate element; and

a plurality of spring elements, said plurality of spring elements pushing said plate element onto the multiple board array.

Claim 9 has been replaced with the following:

9. An apparatus for separating individual circuit board from a multiple board array with pre-scored planes and a plurality of electrical components comprising:

at least one splitting element positioned along one of the pre-scored planes; and

at least one torque inducing element using surface loading to mechanically [forcing] force the multiple board array onto said at least one splitting element and thereby breaking the multiple board array along the pre-scored plane said at least one torque inducing element forcing the multiple board array without loading the plurality of electrical components; and

a transport element for automatically positioning said at least one splitting element along one of the pre-scored planes.

Claim 11 has been replaced with the following:

11. An apparatus as described in claim [9] 10 wherein said stabilizing element includes a plate element; and

a plurality of spring elements, said plurality of spring elements pushing said plate element onto the multiple board array.

Claim 16 has been replaced with the following:

16. A method for separating individual circuit boards from a multiple board array with pre-scored planes comprising:

positioning a splitting element along one of the pre-scored planes, and

inducing torque on the multiple board array such that the multiple board array is forced onto the splitting element and breaks along the pre-scored plane.

New claims 20 and 21 have been added.